AMENDMENTS TO THE SPECIFICATION

Please replace paragraph [1002] with the following amended paragraph:

[1002] This application also relates to the following co-pending patent applications which are filed on the same day as the present application:

United States ~~patent application Serial No. ________ (Attorney Reference No. 004-5619)~~ Patent No. 6,665,852 B2, issued December 16, 2003, entitled "Piecewise Linear Cost Propagation for Path Searching," naming Zhaoyun Xing and Russell Kao as inventors; and

United States ~~patent application Serial No. ________ (Attorney Reference No. 004-6815)~~ Patent Application No. 09/998,559, filed November 30, 2001, entitled "Short Path Search Using Tiles and Piecewise Linear Cost Propagation," naming Zhaoyun Xing and Russell Kao as inventors.

Please replace paragraph [1054] with the following amended paragraph:

[1054] During compute exit boundary segment source costs operation 545, the cost of paths from the source through the entry segment to the new tile's other boundary segments, the exit segments, are calculated. Each ~~of~~ exit segment may or may not be different from the entry segment. A new source cost is computed for each exit segment and compared to the source cost already stored on that segment (e.g., an initialized value of the source cost). If the newly computed source cost is less than the old source cost (at any point), then a shorter path has been found. In that case that exit segment's source cost is set to the minimum of the two source costs, the back pointer(s) is(are) updated, and the segment is entered into the priority queue at the appropriate location for future consideration.

Please replace paragraph [1069] with the following amended paragraph:

[1069] For the first case in which the entry and exit segments are determined to be perpendicular to each other during operation 2410, the following discussion assumes the exit segment lies along the left edge of the clear tile: $x = x_{BL}$, $y \in [c,d]$ as shown in Figure 9. The source cost to the exit segment may be determined by adding the source cost at the entry segment to the cost of the path from the entry segment to the exit segment (e.g., a propagation cost).

However, in the present embodiment, the cost of the path from the entry segment to the exit segment is not explicitly calculated. For each point, (x_{BL}, y) on the exit segment, we're interested in finding the least cost path to that point over all the possible entry points that could be used to enter the tile. For the path depicted as a dashed line in Figure 9, the source cost is given by:

$$\begin{aligned} g(y) &= \min_{x\in[a,b]}\{f(x)+\alpha\,|\,x-x_{BL}\,|+\beta\,|\,y-y_{BL}\,|\} \\ &= \beta\,|\,y-y_{BL}\,|+\min_{x\in[a,b]}\{f(x)+\alpha\,|\,x-x_{BL}\,|\} \\ &= \beta\,|\,y-y_{BL}\,|+m \end{aligned}$$

where $m=\min_{x\in[a,b]}\{f(x)+\alpha\,|\,x-x_{BL}\,|\}$ is a constant with respect to y. Referring again to Figure 24, the knot values of the piecewise linear function $\beta\,|y-y_{BL}|$ are found during operation 2432. The function $p(x)=f(x)+\alpha\,|\,x-x_{BL}\,|$ is the sum of two piecewise linear functions and therefore is also piecewise linear. Since the minimum of a piecewise linear function must occur at one ~~if~~ <u>of</u> its knots, m can be found by examining the knots of $p(x)$ during operation 2434, and taking the minimum of such knot points during operation 2436. Thus the source cost at the exit segment, $g(y)$ is a piecewise linear function which may be found by analyzing ~~it's~~ <u>its</u> knot point(s) (e.g., 1-3 points) during operation 2438.

Please replace paragraph [1080] with the following amended paragraph:

[1080] The LMC of a piecewise linear function can be found by finding the minimum of the LMCs of all the functions linear segments. For example, assume $f(x)$ is piecewise linear defined as

$$(x_i, f(x_i)),\ 0 \le i \le n-1,\ a = x_0 \le x_1 \le \ldots \le x_{n-1} \le x_n = b.$$

The brute force approach of finding the LMC of $f(x)$ is to compute $(\alpha * f_i)(x)$ first. Function $(\alpha * f)(x)$ can be computed by finding the minimum of all functions $(\alpha * f_i)(x)$. The fastest algorithm for finding the minimum function of two piecewise linear functions is linear in terms of n, the number of segments. Therefore, the brute force algorithm to ~~computer~~ <u>compute the</u> LMC of $f(x)$ is quadratic in terms of number of segments.

Please replace paragraph [1083] with the following amended paragraph:

[1083] Figure 19 shows a linear running time method of finding the LMC of the piecewise linear function $f(x)$. A positive number α and a list L are received during input operation 1910. The list $L = \{l_0, l_1, \ldots, l_{n-1}\}$ is a sorted list of line segments that represents the continuous piecewise linear function $f(x)$ for an entry boundary segment. Next, during forward leg sweep operation 1920, a forward clipping sweep is performed on the input cost function. The forward clipping sweep is discussed in greater detail below with reference to Figure 20. After forward leg sweep operation 1920 and during backward leg sweep operation 1930, a backward clipping sweep is performed. The backward clipping sweep is analogous to the forward clipping sweep except in the opposite direction, and is easily implemented by one of ordinary skill in the art based on the teaching herein regarding the forward clipping sweep. After backward leg sweep operation 1930 and during output operation 1940, the LMC of the cost function is output as a result from sweep operations 1920 and 1930. For example, L, the list of line segments that represents $(\alpha * f)(x)$, a continuous piecewise linear function is provided. After output operation 1940, the source cost of the exit segment may be calculated using the LMC of the entry cost function as discussed herein.